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Some Observations on Caesarean Section in Farm Animals

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Introduction

CAESAREAN section has become increasingly popular since the advent of the sulphonamides and penicillin, which have improved the prognosis immeasurably, and have made the operation practicable under all conditions. This has greatly widened the scope of the veterinary obstetrician, and at the same time, one wonders if the foetus which previously would have successfully struggled into the world by the conventional route, is not too often " . . . from his mother's womb, untimely plucked."

In 1882, Max Sanger (1882, 1886, 1887), by advocating the use of Lembert's intestinal suture for closure of the uterus following hysterotomy, completely altered the prognosis of caesarean section in the human. Whereas before Sanger's technique, the only indications for caesarean section were extreme deformity or space-occupying neoplasms of the pelvis, the indications were now extended to such a degree that the operation was in danger of being abused.

Whitridge Williams, addressing the Clinical Congress of Surgeons of North America in 1916, said, " Unfortunately, history shows that advances in the practice of medicine and surgery are rarely attained in a thoroughly rational manner, and that a period of undue enthusiasm, or even absurd reckless abuse, usually precedes the establishment of the actual value of the given procedure—I believe we are at present going through such a stage in connexion with caesarean section."

And again, F. S. Kellogg in 1916 posed the question, " On what indication is it (caesarean section) being advised in this community? The honest answer is—almost anything that keeps a baby from flopping into the world itself!"

The alternative to caesarean section in the larger farm animals that cannot be delivered by correction of abnormal posture or by a limited degree of forced traction, is embryotomy. Many veterinary surgeons view embryotomy with distaste, and yet have never tried percutaneous embryotomy using a modern embryotome and embryotomy wire. Several continental schools perform extensive embryotomy, believing caesarean section to be both unnecessary and impractical.

Vandeplassche (1953) wrote, " The preferred obstetrical method is not the one that will simply deliver a cow, but that method which will most frequently give the best result for the farmer, providing that the obstetrician can apply it satisfactorily. This means that the obstetrical result largely depends on the skill of the operator. A veterinarian may be a good surgeon and yet have little skill or experience in embryotomy. In this case the indications for caesarean section will be more numerous for him than for a colleague who is skilful in embryotomy, but has little experience in surgery."

Apart from these natural limitations, which are bound to influence any individual obstetrician when making a decision, the following points can be profitably examined, in the light of information that has been published since 1949, during which period caesarean section in large animals has become increasingly popular.

Indications for Caesarean Section and Embryotomy

As far as the time factor is concerned, extensive embryotomy is both time-consuming and exhausting, but it can readily be performed with the minimum of lay help.

Caesarean section, on the other hand, is a comparatively quick procedure, but of necessity it requires a lot of preparation and considerable cleaning up afterwards, and these factors must be borne in mind by practitioners who only do a minimum of surgery and who have no permanent surgical team. In

addition to this, although it is possible to operate with only lay help, to carry out such major surgical interferences, it is ideal to have a professional assistant.

Certain conditions in late pregnancy are often automatically indications for the performance of a premeditated caesarean section:—

(a) Severe illness of the dam in late pregnancy, especially when she is carrying a valuable calf, *e.g.* traumatic pericarditis.
(b) Gross hydramnios or hydrallantois.
(c) Fracture of pelvis with displacement.
(d) Preparturient recumbency, seen in the older animal.
(e) Ventral rupture.

In addition, there are certain unpremeditated conditions in which vaginal delivery is extremely difficult, and in which caesarean section must be attempted:—

(a) Irreducible uterine torsion.
(b) Failure of cervical dilatation.
(c) Gross swelling of the vulva and vagina, due mainly to lay interference, making vaginal manipulation almost impossible.

One's own common sense must dictate the pros and cons of every case—no two are alike. It is generally agreed that the most difficult cases to assess are not those involving postural abnormality or gross anatomical deformity, but those cases of disproportion in which one is unable to gauge accurately the foetal size in relation to the maternal pelvis until the foetus is impacted in the pelvis, and one is virtually committed to a vaginal delivery. Cases of disproportion, where the only possibility of delivery is by considerable forced traction, are some of the commonest indications for caesarean section and should be excellent risks.

In all other cases in which the type of dystocia can be rectified equally suitably by embryotomy or caesarean section, the guiding factor must be the obstetrician's personal ability coupled with the condition of the foetus. It is suggested here that where there is a dead or putrid foetus in which the condition of the genital tract is suitable for embryotomy, caesarean section is contra-indicated.

Vandeplassche (*loc. cit.*) concluded, "In every case of dystocia the veterinarian has to decide which is the best obstetrical method, and this can be done only after an exact diagnosis has been established. He has to consider in the first place the interest of the owner and not the personal effort and strain which is required of him, and consequently he must perfect his skill in the various obstetrical techniques. A veterinarian who finds on arrival the head, forelegs, and thorax of the foetus external to the vulva of a heifer, and decides on a caesarean operation, may be a good surgeon, but he is not an obstetrician who adapts to each case the best available technique. The same may be said of a veterinarian who prefers the caesarean operation because it is the easiest way for him to overcome a difficult dystocia. The easiest way is still forced traction, but its results are poor, and therefore it has been discarded.

"We must take great care that the great value of caesarean section in veterinary obstetrics is not lost, and the operation discredited by its application in cases where it is not indicated."

Post-operative Effects on Fertility

Having considered briefly the indications for caesarean section and embryotomy, what are the after-effects upon fertility following these manipulations?

In 1953, Vandeplassche compared the results of embryotomy and caesarean section. He quoted a post-operative fertility rate of 82 per cent. following embryotomy compared to one of 55 to 60 per cent. following caesarean section. However, he did not state on how many cases his figures were based.

In 1956, he quotes from 489 cattle subjected to caesarean section of which 276 were bred again. 207 of these, or 75 per cent., proved to be in calf within 1 year of the operation.

To get a more accurate picture, if more complicated cases such as uterine torsion, failure of cervical dilatation, and gross foetal contamination are excepted, 151 cows and heifers were operated on at his clinic for delivery of a live, oversized foetus, and of these, 119 or 78 per cent. bred again.

This figure compares unfavourably with the fertility rate of 88 per cent. found on the study of 44,000 herd book cattle in the province of Ghent, Belgium, following normal calving (Butaye, 1956). Vandeplassche (1956) considered the main cause of lowered fertility was due to the post-operative retention of foetal membranes, which occurred in 35 per cent. of his cases (compared to 3 to 5 per cent. after normal calving) and to the development of serious uterine adhesions in 42 per cent. of cases.

Anaesthesia

Since the lifting of the restrictions of the Animals Anaesthetic Act of 1919, it is now permissible to perform laparotomies under complete or partial local anaesthesia. It is extremely difficult to offer any hard and fast guide as to the best type of anaesthetic to use under practice conditions. In each case one must assess the condition of the mother and foetus, the anaesthetic agents available, and the competence of the anaesthetist to apply these agents. The safety and efficacy of any anaesthetic technique is determined by the skill of the administrator.

The object of anaesthesia is primarily to prevent pain, but for the surgeon to operate under the best conditions, it is essential to produce muscular relaxation of the operating field. In the human, and all domestic animals except the ruminants, specific muscle relaxant drugs have been used for some years (Hall, 1957), but in the very nature of their action they produce partial or complete paralysis of the respiratory muscles, and thus necessitate assisted or controlled respiration over the period of their effect, and for this it is necessary to have apparatus available which many practitioners do not possess.

Unfortunately, in the light of our present knowledge, these drugs are extremely dangerous when used on ruminants, and therefore we must resort to other methods of producing this ideal relaxation.

No one anaesthetic drug by itself will produce this.

Various techniques are well known for blocking specific segmental nerves supplying the abdominal wall, but each method when used on its own, has its limitations. Paravertebral anaesthesia (Arthur, 1956) or local " Field Block " of the abdominal wall are widely used in the performance of caesarean section, but the desirability of performing a major laparotomy after merely desensitising the skin, abdominal musculature, and an area of parietal peritoneum requires further investigation. Human patients operated upon under regional nerve block complain of marked discomfort and nausea when abdominal packs are inserted or when the uterus is handled, and may momentarily lose consciousness due to a sudden fall in blood pressure associated with a viscero-cardiac reflex (Keating, 1956). This discomfort on handling the uterus has been a constant feature observed by us in a series of 32 caesarean operations on sheep, in which there has been complete analgesia of the abdominal wall and parietal peritoneum.

Anterior epidural anaesthesia in the cow is simple to administer, but difficulty is often experienced in getting the local anaesthetic far enough forward to produce analgesia of the anterior abdominal wall. The necessity of blocking the anterior segmental nerves to produce this analgesia acts as a 2-edged sword, as of necessity it blocks variable numbers of splanchnic roots, causing vaso-dilatation in the splanchnic area with a concomitant fall in blood pressure, which may jeopardise the life of the foetus by causing placental ischaemia. In addition, the head and fore limbs of the patient's body require forcible restraint, and the animal may be unable to stand for periods of up to 12 hours post-operatively, during which time the udder may be damaged and serious injury sustained to the hind legs.

The use of segmental epidural block, as originally described by Magda *et al.* (1952) overcomes some of the difficulties associated with the sacro-coccygeal route, but it is an exacting technique to carry out.

The veterinary anaesthetist must bear these physiological side effects in mind when he relies solely upon regional analgesia for major obstetrical surgery, and in addition, he has not got the advantage of a co-operative patient, and therefore must restrain the animal throughout the period of the operation. This restraint is ideally enforced by the use of some narcotic agent. The combination of narcotic and regional nerve block produces ideal operating conditions which neither of the combined techniques produce on their own, and is in full accord with the accepted principles of Lundy's Balanced Anaesthesia (Lundy, 1942).

To give an example, chloral hydrate has to be administered to an almost dangerous level to produce satisfactory relaxation. Recovery following its use is slow, and in large doses it may cause serious degenerative changes in the liver. If, however, it is used merely to induce narcosis and relaxation is produced by paravertebral block, one has an excellent combination providing satisfactory abdominal relaxation with the minimum of danger and discomfort to the patient.

Exposure of the Uterus

Messervy (1956) cites 54 cases of caesarean section performed in the standing position, using a flank approach under paravertebral anaesthesia. In the hands of a surgeon experienced in the technique this approach avoids the dangers of rumenal tympany and aspiration of rumenal contents that one associates with prolonged lateral recumbency in the cow, and allows excellent exposure and exteriorisation of the uterus.

However, in cases where the animal is exhausted or where partial embryotomy may be necessary to extract the foetus it has disadvantages, including the difficulty of supporting the foetus during partial embryotomy, the possibility of extrusion of small intestine, and the danger of the animal collapsing from exhaustion or discomfort occasioned by traction upon the uterus.

Laparotomy through a lower abdominal incision with the animal restrained on its back has been reported in the cow by Wright (1949, 1950) and in the ewe by Harmar and Mount (1951), Walsby (1952), and Arthur (1952). The two main objections to this approach are that, particularly in the cow, difficulty may be found in lifting the uterus up to the abdominal incision, especially in cases where the foetal fluids have been lost and the uterus contracted down on to the foetus, and in addition, the increased weight of the pregnant uterus and abdominal contents may cause compression of the posterior vena cava, seriously affecting venous return to the heart, leading to death, or severe respiratory and cardiac embarrassment.

Laparotomy through a flank incision with the animal in lateral recumbency, is reported by Gould (1951) Parkinson (1952) in the cow, and by Milne (1951), Mackinnon and Bayliss (1952), and Parkinson (1952) in the ewe. All favour a vertical incision, high or low in the flank. Vandeplassche (1953) favours an incision parallel and lateral to the milk vein, whereas Young (1953) advocates an incision on a line drawn from the stifle to the ziphisternum.

After trying all the recommended approaches on the cow, a modification of Young's approach has

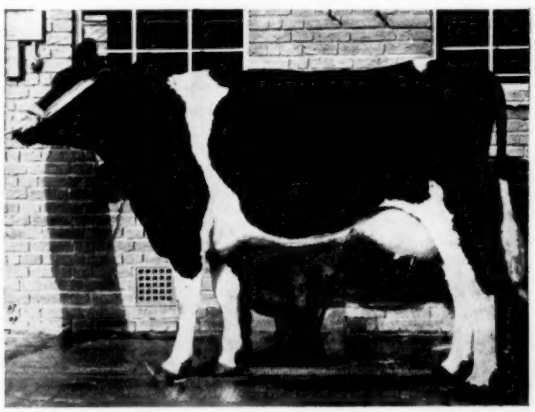

FIG. 1.

been finally adopted using as a landmark a line joining the pubic brim to the ziphisternum (Fig. 1). This has the advantage that the incision overlies the normal line of the gravid uterus, and being on that line, the incision can be readily extended in either direction in case of need. In addition, the incision passes through the main muscle mass of the internal oblique in the direction of its fibres, avoiding excess surgical trauma.

In the ewe, a vertical flank incision through skin and cutaneous trunci muscle, followed by a muscle-splitting incision of the abdominal muscles produces adequate exposure of the uterus, and inflicts the minimum of tissue damage.

In the sow, Wright (1950) recommends an incision parallel to, and 3 inches above, the bases of the hypertrophied mammary glands. This gives excellent exposure, but it is best to make the incision 3 inches above this, thus avoiding the rectus muscle, and preventing the direct weight of the hypertrophied mammary glands, which are extremely heavy in the parturient sow, from pulling directly on the lips of the incision (Fig. 2).

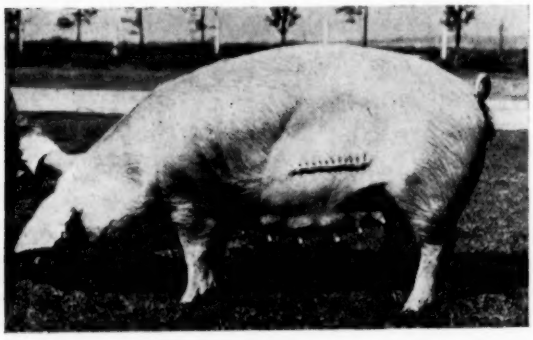

FIG. 2.

Abdominal Closure

With regard to the closure of the abdominal incision, techniques vary considerably, and once a satisfactory method has been arrived at, most surgeons tend to adhere to it. The combinations of suture materials and types of stitches used are legion, and being conservative people, in the widest sense of the word, surgeons will adapt their formula to suit all eventualities.

It is common practice to suture the abdominal wall of the cow with either a single eversion suture involving the skin, muscle, and peritoneum in one, or to close the muscle layers and peritoneum with one suture and the skin separately.

Neither of these methods is ideal, as they fail to ensure satisfactory apposition of the peritoneum, of necessity involve the use of coarse suture material, and in the case of the single through and through suture, provide a direct contact between the skin and peritoneum. Hickman (1950) stressed the prime importance of secure closure of the peritoneum. This structure heals in a matter of hours and will keep the peritoneal cavity intact even if the overlying muscle sutures should break down. Its continuity reduces the formation of adhesions, and many rumenal fistulae that followed rumenotomy by Götze's method could have been prevented, but for the technique of suturing the rumenal wall to the peritoneum and merely closing the abdominal muscles over the inverted rumenal incision.

In addition, suture material is a foreign body, and the larger it is, the greater the foreign body reaction it will provoke. By closing the abdominal muscles in layers, one not only produces a more accurate anatomical reconstruction of the tissues, but by spreading the stress over a greater area, one's suture materials may be correspondingly finer.

It should be finally emphasised that now caesarean section is recognised as a practical and worth-while procedure in large animals, it should not be used as a last-ditch manoeuvre. It is undoubtedly a major operation and the surgical risk to both mother and foetus is greatly increased after prolonged vaginal interference.

In case one is under the impression that veterinary obstetricians alone are faced with this dilemma, the following quotation from part of an address by T. N. A Jeffcoate, M.D., at the Annual Meeting of the B.M.A., 1953, is of interest:—

"It is in the case in which forceps have been applied, and in which unexpected difficulty is encountered that tragedy may occur. The tragedy results from a train of human reactions which have personal pride and prestige as their base. We have all experienced them. The unexpected resistance to delivery is followed by a stronger pull and then removal of the blades to confirm the position of the foetal head. Further traction with little effect brings to mind the vision of a stillbirth. Now is the time to stop, but the patient and her relatives have been prepared for forceps delivery, not caesarean section. Moreover, it requires more courage to admit to assistants, midwives, and onlookers that a mistake has been made, and that vaginal delivery is not safe. The remote possibility of successful delivery spurs the obstetrician to renewed and more frantic efforts. Now he is seized with dread, casts caution to the winds, and ultimately he may or may not succeed in extracting a mangled foetus, the mother also being injured in one way or the other."

Summary

1. The indications for caesarean section and its after-effects upon fertility are discussed.

2. The use of regional nerve block techniques for obstetrical surgery are reviewed, and emphasis is placed on the use of balanced anaesthesia.

3. Methods of exposing the uterus and closing the abdomen are summarised with reference to information published since 1949.

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(*For references please see foot of column 1 overleaf*)

The Treatment of *Vibrio fetus* Infected Bulls

BY

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BULLS infected with *Vibrio fetus* remain, as far as is known, both infected and infective for the rest of their lives whereas cows acquire a tolerance to the disease and many conceive normally some three months after infection even to known infected bulls. A reliable and simple method of curing infected bulls is, therefore, of considerable value in the control of Vibriosis.

Many workers have reported on the sensitivity of *V. fetus* to antibiotics, *e.g.*, Jennings (1947), Terpstra and Eisma (1951), Flatla, Braend and Sudboe (1952), Plastridge and Easterbrooks (1952), McPherson and Fish (1954), Ryff and Breen (1956), and Mundt (1956). Most workers reported a sensitivity to 0.6 to 5.0 μg. per ml. of streptomycin; some strains, however, required as much as 75 μg. per ml. of streptomycin to inhibit growth and some were reported to be resistant to concentrations of 100 μg. per ml. or more of streptomycin.

Antibiotics have been used in the treatment of infected bulls either parenterally or as local applications to the mucosa of the penis and sheath, with or without epidural anaesthesia, or as a combination of both treatments. Successful treatments have been reported by Lofthouse (1951), Terpstra *et al.* (1951), Flatla *et al.* (1952), Merkt and Sanchez-Garnica (1952), and Edgson and Scarnell (1955). However, Sjollema (1952), Easterbrooks, Plastridge, Williams and Kiggins (1955), Adler (1956), and Hughes (1956) have reported that some bulls were found to be still infected after treatment by one or other of these methods.

The encouraging results reported following the treatment of infected bulls with antibiotics applied locally to the mucous membrane of the penis and sheath, without the use of anaesthesia, led us to investigate further the use of this method and the results are given below.

Materials and Methods

All the bulls were diagnosed as carriers of *V. fetus* by test-mating on known vibrio-free heifers as previously described by Adler (1952) and Morgan (1956). The organisms were isolated from the heifers after insemination and examined biochemically and serologically. In all cases, they were catalase positive, did not produce hydrogen sulphide, and reduced nitrates to nitrites. Formolised suspensions of all the strains were agglutinated by stock sera for *V. fetus*. The sensitivity to streptomycin of most of the strains was also determined by using Brewer's medium. The results of these are recorded in Table I:—

TABLE I
THE SENSITIVITY OF STRAINS OF *V. fetus* TO STREPTOMYCIN

Strain	Concentration of Streptomycin (μg. per ml.) Inhibiting growth	Allowing growth
F2	5	1
F10	5	1
S1	5	1
F1	20	10
A1	5	1
H1	1	<1
A2	5	1
S2	1	<1
F4	10	5
S3	5	1
H2	5	1

Two antibiotic suspensions were used:—

1. An antibiotic infusion consisting of 2 g. streptomycin and 1,000,000 units of penicillin in an oily base, the volume being made up to 100 ml.
2. An antibiotic cream consisting of 2 g. of streptomycin and 1,000,000 units of penicillin (the volume again being made up to 100 ml.) and dispensed in a collapsible metal tube.

Infected bulls were restrained in stocks and the preputial orifice and the underside of the belly

Some Observations on Caesarean Section in Farm Animals.—*Concluded.*

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thoroughly washed with a 1 per cent. cetrimide* solution. The antibiotic suspension was introduced into the posterior third of the prepuce by injecting it through a sterile catheter with a syringe. A gauze bandage was tied round the preputial orifice and the antibiotic suspension distributed throughout the prepuce by massaging for one minute every 10 minutes. After one hour, the bandage was removed and the bull transferred to a thoroughly disinfected box with clean bedding. This treatment was applied once daily for three days. On a few occasions, urine collected in the sheath after injecting the antibiotic and the pressure made massaging difficult or caused the bandage to come off.

Seven bulls were treated using the antibiotic infusion and six with the antibiotic cream.

Results

Each bull was test-mated on known vibrio-free heifers 14 days after the last treatment, using one heifer per bull, and this was repeated once again eight weeks later. Two months after treatment bull F10 had to be disposed of because of an incurable lameness. The remaining 12 bulls were test-mated periodically for a period of up to 12 months. Starting at a week after the insemination, vaginal mucus and uterine biopsy samples were cultured twice weekly until six examinations had been made. In the latter part of the experiment, uterine biopsy sampling was discontinued as experience had shown that vaginal sampling was sufficient and, at the same time, was less damaging to the test heifers. The results of cultural examinations of heifers inseminated with the semen of the 13 bulls before and after treatment are summarised in Table II.

TABLE II

CULTURAL RESULTS FROM HEIFERS INSEMINATED WITH THE SEMEN OF BULLS PRIOR TO AND FOLLOWING THEIR TREATMENT

Bull	Presence or Absence of Infection in Inseminated Heifers				
	Before treatment	After treatment			
		2 weeks	2 months	6 to 7 months	1 year
F2	+	−X1	−	−	−X2
F10	+	−	−	Bull disposed of	
F1	+	−	−	−X2	−
A2	+	−	−	X2	−
S2	+	−	−	−	−
F4	+	−	−	−X2	−
S3	+	−	−	−	−
G17	+	−	−	−	−X2
S1	+	−	−	−	−
A1	+	−	−	−	−
H1	+	−X2		−X2	−
F5	+	−	−	−	−X2
H2	+	−	−	−	−

X1 *V. fetus* recovered on one occasion only.
X2 Catalase negative vibrios recovered.
Bulls F2–S3 treated with antibiotic infusion.
Bulls G17–H2 treated with antibiotic cream.
Bulls F2 and G17 were also tested at nine months with negative results.

* Cetavlon.

The first heifer inseminated with the semen of bull F2 after treatment gave a culture of *V. fetus* on one occasion only. Three other heifers inseminated with the semen of this bull were negative for *V. fetus*. Apart from this, *V. fetus* was not recovered from any of the heifers inseminated after the bulls had been treated. Catalase negative strains were occasionally recovered from some of the heifers.

All 12 bulls were, therefore, successfully treated and have remained free of infection for 12 months. It is proposed to continue testing all the available bulls to ensure that they remain free of infection.

Discussion

The results obtained by the treatment of *V. fetus* infected bulls, using a mixture of streptomycin and penicillin, confirm the findings of previous workers that such methods of treatment are effective. Adler (1956), however, reported that some infected bulls which had apparently been successfully treated were shown to be infective when test-mated about a year later. Similar apparent breakdowns have been reported by the American workers referred to earlier. It is not known definitely, however, whether these breakdowns were the result of an unsuccessful treatment or reinfection following a successful treatment.

These findings stress the need for the proper application of the treatment and for stringent precautions to be taken to prevent possible reinfection. It is recommended, therefore, that treatment of infected bulls should be followed by periodic test-matings to ensure freedom from *V. fetus* infection.

The finding of catalase negative strains of vibrios in the test-mating heifers after insemination is in accordance with previous experience at this laboratory. Catalase negative vibrios have also been commonly found in the semen and preputial mucosa of bulls and have occasionally been recovered from the vaginal mucus of maiden heifers (Frank, Bryner & Caruthers, 1956; Morgan, 1956). No importance has been attached to finding vibrios of this type.

Acknowledgments.—The authors wish to express their appreciation to the National Institute for Research in Dairying for providing one of us (W. J. B. M.) with facilities for the bacteriological work, and to Messrs. Glaxo Laboratories Ltd., for their help and preparation of the antibiotic suspensions used. The help of Mr. W. Bruce is also gratefully acknowledged.

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An Outbreak of Abortion in Ewes due to *Salmonella dublin*

BY

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Introduction

THE two principal Salmonella infections which have been recorded in sheep are *S. abortus ovis*, which causes abortions when the initial infection becomes generalised (Buxton, 1957), and *S. typhimurium*, which is commonly responsible for enteric disease in sheep in Australasia, especially in New Zealand (Jebson, 1950) where it may become endemic in the summer in certain districts, the clinical condition taking the form of initial sudden death with subsequent cases showing varying degrees of diarrhoea.

Salmonella dublin, although it has been frequently incriminated as a cause of enteric disease in cattle and is known to occur in an endemic form in certain parts of the United Kingdom (Buxton & Field, 1949), has not hitherto been recorded as a pathogen of sheep, although, Buxton and Field recovered the organism from the mesenteric lymph gland of a sheep during a routine examination of 62 specimens from a slaughterhouse.

History

The affected flock of 80 ewes consisted of three groups, 30 four-year-old Cheviots, 30 four- to six-year-old Blackface, and 15 Half Bred and five Shetland ewes. These groups had come from widely different sources and were wintered locally in separate units, grass being the sole feed. Lambing was due to begin in the third week of March and the groups were assembled about the third week of February, and folded on turnips. Hay was fed in racks. Within a week, one Blackface and one Cheviot ewe aborted. At the end of the first week in March the ewes were taken about three miles on foot to their lambing ground which consisted of 12 acres of three-year-old rye-grass—white clover pasture—divided into two fields. The croft was on an exposed hillside about 500 feet above sea-level and had been free from stock since the previous October when the last of some fattening hoggs had been sold. There were no watering facilities. After two days, one Cheviot ewe was found dead, two others aborted twins, and one gave birth to a premature lamb which died in three days. Amongst the Blackface, three ewes gave birth to stillborn lambs and one ewe produced slightly premature twins, one of which was dead and the other is still alive. One more Cheviot aborted on March 26th, and on March 31st normal lambing began. When seen on April 22nd one Blackface had just aborted and only 6 ewes remained to lamb. The lambing percentage was approximately 140.

Clinical Symptoms

No symptoms were observed by the farmer until the first ewe aborted, but when the flock was examined on March 26th, it was noticed that quite a number showed either a clear or muco-purulent discharge from the eyes and nose. When these animals were handled the wool came away readily in the hands. The flock was greatly agitated whilst being gathered so that temperatures and pulse rates were not taken. Only a few of the aborted ewes were present and these were sluggish and toxic, with evidence of a purulent vaginal discharge on their hind quarters.

Laboratory Examinations

During the routine examination of a placenta received from the veterinary surgeon in attendance, a good growth of a non-lactose fermenting organism was observed on the blood agar and MacConkey plates incubated aerobically and on a bacto-tryptose dye agar plate incubated in 10 per cent. CO_2.

Sera from the flock were titrated in tubes against known Typhi " O " and *S. dublin* " H " antigens in a water bath at 50° C. for two hours in the latter instance and four hours and overnight in the former. Doubling dilutions from 1:25 to 1:12,800 were used. In some cases this was taken a dilution further.

One-gramme samples of faeces were collected straight into selenite F. broths and incubated at 37° C. for 24 hours before plating on MacConkey's agar. When a non-lactose fermenting growth was obtained a colony was picked off and inoculated into sugars and onto nutrient agar slopes for the slide agglutination tests, and a further MacConkey plate sown as a test for purity.

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Results

It was not possible to examine all the ewes but various specimens were taken from 49 animals as circumstances allowed. The results are divided into three groups. Where no agglutination occurred with the "H" antigen, no examination was made with the "O" antigen.

TABLE I
ABORTED GROUP

Ewe	Material	*S. dublin*	Antibody titre	
			O	H
1	Placenta ...	+		
2	Faeces	−		
	Serum		1 : 100	1 :100
	Foetus—lung ...	+		
	liver ...	+		
	stomach	+		
	Placenta ...	+		
3	Serum		1 : 800	1 : 800
4	Faeces	+		
	Serum		1 : 800	1 : 800
5	Faeces	+		
	Vaginal swab ...	+		
	Serum		−	−
6	Faeces	−		
	Vaginal swab ...	−		
	Foetus—lung ...	−		
	liver ...	−		
	stomach contents	−		
7	Faeces	−		
	Vaginal swab ...	+		
	Serum		1 : 12,800	1 : 6,400
8	Faeces	−		
	Serum		1 : 400	1 : 50

Ewe No. 6 died about one hour after aborting.

TABLE II
CLINICAL GROUP (EYE AND NOSE DISCHARGE)

Ewe	Material	*S. Dublin*	Antibody titre	
			O	H
9	Faeces ...	−		
	Serum ...		1 : 200	1 : 50
10	Faeces ...	−		
	Serum ...		1 : 400	1 : 100
11	Faeces ...	+		
	Serum ...			−
12	Faeces ...	+		
	Serum ...		1 : 800	1 : 800
13	Faeces ...	−		
	Serum ...			−
14	Faeces ...	−		
	Serum ...			−
15	Faeces ...	−		
	Serum ...			−

TABLE III
APPARENT NORMAL GROUP

Ewe	Material	*S. dublin*	Antibody titre	
			O	H
16	Faeces ...	−		
	Serum ...		1 : 800	1 : 100
17	Faeces ...	−		
	Serum ...		1 : 200	1 : 100
18	Faeces ...	−		
	Serum ...		1 : 3,200	1 : 800
19	Faeces ...	−		
	Serum ...		1 : 800	1 : 100
20	Faeces ...	+		
	Serum ...			−
21	Faeces ...	+		
	Serum ...			−
22	Faeces ...	+		
	Serum ...			−
23	Faeces ...	+		
	Serum ...			−
24	Faeces ...	−		
	Serum ...		1 : 100	1 : 50
25	Faeces ...	+		
	Serum ...		1 : 800	1 : 100
26	Faeces ...	+		
	Serum ...		1 : 800	1 : 400
27	Faeces ...	+		
	Serum ...			−

The remaining 22 ewes in this group were negative, to both faeces and serum examinations.

Discussion

Eleven ewes out of a total of 80 aborted or produced stillborn lambs. *S. dublin* was recovered from 14 animals in the 49 examined and a further nine (3, 8, 9, 10, 16, 17, 18, 19, 24) gave serum titres which could be indicative of infection. This makes a total of 23 ewes in which the infection was present.

Whether the outbreak originated from a carrier animal or from vermin was not established. No contact with cattle was discovered. The hay which the animals had been fed whilst on the turnips had been baled and stored in an old shed, the floor of which was heavily contaminated with rat faeces. Underneath the shed passed an old, but still used, sewage culvert built of stone and covered with flagstones. The farmer's information stated that rats gained entrance to the shed from this drain and that there had been a number of nests in the bales before they were moved. Rat faeces were examined but yielded negative results on bacteriological examination and no rats became available for direct examination.

None of the Half Bred or Shetland ewes aborted and at no time did any of the ewes scour.

(Continued at foot of column 1, page 695)

Salmonella Infection in Sheep in Cyprus

BY

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Veterinary Service, Nicosia, Cyprus

ALTHOUGH non-specific Salmonella infection has been recognised in sheep for at least 37 years, very few outbreaks of disease due to these organisms have been recorded.

Hutyra & Marek (1946) refer to an outbreak caused by *Salmonella typhi-murium* which was described by Frikinger in 1919 and in which 260 animals of all ages were affected in three flocks. Of these, 140 died or were slaughtered and 2,000 cases of human food poisoning resulted. The same outbreak was described by Bruns & Gasters (1920).

Three outbreaks in Colorado were recorded by Newsom & Cross (1924–5, 1930 and 1935) amongst lambs in transit presumably about six months of age. The causal organism was again *S. typhi-murium*. In their first outbreak in 1923 about 2,000 lambs died out of a total of 30,000. Six years later they diagnosed the disease in a batch of 1,600 lambs of which 30 died. In 1934, 111 lambs died out of a total of 1,500. It is of interest that only three such outbreaks were diagnosed amongst lambs in transit over a period of 10 years although the authors were seeking further cases of infection. In the opinion of these workers the predisposing cause in each instance was a long rail journey with insufficient food.

The following account is given of five outbreaks of *S. typhi-murium* infection amongst local flocks of sheep. Ovine salmonellosis has not previously been recognised in Cyprus and its significance under Middle Eastern conditions is still not clear. It is hoped that by recording these outbreaks further information may come to light.

An Outbreak of Abortion in Ewes due to *Salmonella dublin*.—*Concluded.*

Summary

(a) An outbreak of abortion in ewes is described in which 11 abortions or stillbirths occurred in 80 ewes. Out of 49 examined, *S. dublin* was recovered from 14, and serological evidence suggested nine others to have been infected, making a total of 23 or approximately 47 per cent. infection rate.

(b) No scouring was evident during the outbreak.

(c) No conclusive evidence was found as to the source of the infection.

Acknowledgments.—I am indebted to Dr. Joan Taylor of Colindale who confirmed the identity of *S. dublin*, and to R. S. Cowie, Esq., M.R.C.V.S., who sent in the original specimen.

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History of Outbreaks

A. *Tricomo-Nicosia, November*, 1955

Four flocks were involved but the burden of infection lay on one flock of 35 head which lost 10 animals. This flock had been grazing with three others at Tricomo during the summer and had just been brought to the neighbourhood of Nicosia. Five ewes had died after a short illness. The history of these early cases agreed closely with the symptoms observed later and it was assumed that they were part of the same outbreak. The principal symptoms were a pyrexia, usually about 106° F., depression and an acute diarrhoea usually showing blood and mucus. Death followed in one to three days.

Two sick ewes and a lamb were examined from this flock and *S. typhi-murium* was isolated from faecal cultures in each case.

Enquiries made simultaneously at Tricomo revealed that a number of sheep in the three in-contact flocks had shown diarrhoea, and faecal samples or swabs were received from four representative animals. All were positive on culture.

The semi-putrid carcase of a pregnant ewe was obtained from one of these flocks and the organism was isolated from the faeces, bile, mesenteric lymph gland and foetal stomach.

Out of 187 animals in these three flocks, ten were reported sick, and six of them died.

Post-mortem findings included an acute inflammatory condition involving the abomasum and small intestine. In one case the large intestine was affected. The intestinal contents were liquid and usually contained a good deal of blood. Mesenteric lymph glands were enlarged, oedematous and sometimes showed pin-point haemorrhages.

B. *Peristerona*

No further outbreak occurred for 11 months until October, 1956, when two animals were affected in a flock of 70. One of them died.

C. *Prastio*

In November, 1956, four sheep out of eight died in a flock of 50 head. Recovered animals showed very high agglutination titres to *S. typhi-murium*.

D. *Syngrasi*

Three flocks were affected losing 37 sheep out of a total of 300. Eight ewes recovered. This outbreak was of interest in that all three flocks developed the disease simultaneously two or three days after being dipped in a suspension of Gammatox (Gamma isoma of B.H.C.). At the time of visit this bath had been drained and only half an inch of very dry mud remained in the bottom. Samples of this mud on enrichment culture yielded

S. typhi-murium of the same phage group as was isolated from two of the infected flocks. There was no history of diarrhoea amongst any of the flocks which had recently used the dip and the origin of the infection is uncertain. An interesting comparison may be made here with the spread of *Erysipelothrix rhusiopathiae* infections in Australia amongst sheep dipped in non-arsenical solutions.

E. *Lymbia*

This outbreak involved a flock of 65 head and was similar to those previously encountered. Out of 11 infected ewes seven died. Streptomycin in doses of 1 g. daily by the mouth and chloromycetin in doses of 0·5 g. three times daily were given to a few of the sick sheep. Little response was obtained from chloromycetin but the shepherd reported that two ewes in the recumbent state recovered following dosage with streptomycin. From previous experience these two would almost certainly have died if not treated.

Summary of Natural Outbreaks

All the outbreaks recorded here ran a similar course. Most of the sheep to show clinical symptoms did so within two or three days of the onset of the disease. In fatal cases death usually followed in one to three days. Recovery was rapid and no outbreak lasted for more than 10 days to a fortnight.

Differences occurred in the proportion of affected sheep and the percentage of those which died. However, this is to be expected when dealing with small numbers and different flocks under varying conditions of management.

For clarity a summary is given below of the vital statistics of these five outbreaks. In three outbreaks no treatment was given. In the Lymbia outbreak it is believed that two animals recovered as the result of treatment with oral streptomycin.

	Total number in flock	Affected	Died	Recovered
Tricomo-Nicosia	35	10	10	0
„ (1) ...	60	6	4	2
„ (2) ...	62	2	1	1
„ (3) ...	65	2	1	1
Peristerona ...	70	2	1	1
Prastio	50	8	4	4
Syngrasi (1) ...	160	16	12	4
„ (2) ...	60	8	4	4
„ (3) ...	80	3	2	1
Lymbia	65	11	7	4
	707	68 (9·6%)	46 (6·5%)	22 (3·1%)

From the results of serological and transmission tests described later there may well have been a number of inapparent infections also. In such cases the affected animals would show a short febrile disturbance only but would excrete the organism in the faeces for approximately two weeks.

Investigational Work

A. *Materials and Methods*

Unless otherwise stated, faecal samples were first incubated for 24 hours in selenite broth and then plated on Soltys' media (1951). This medium was used also for direct organ cultures.

Blood cultures were made by inoculating 5 ml. of freshly drawn blood into bottles containing 50 ml. of broth plus 0·5 per cent. bile salts. Subcultures on to Soltys' media were made after 1, 5 and 10 days' incubation.

Agglutination tests were carried out by the MRC drop method, but results were read after incubation at 37° C. for 20 hours.

General Investigational Work

A. *Serological*

(1) *Tricomo-Nicosia.*—Two weeks following the outbreak serum samples were obtained from 12 ewes in the first and most heavily affected flock. It is believed that none of these sheep had shown clinical evidence of the disease.

The results were :—

Five ewes : " O " titres 125–500.
Seven ewes : O titres 0–50.

(2) *Athalassa (Negative Controls).*—It was assumed that an " O " titre exceeding 50 was evidence of previous infection. In order to check this, 20 sera were obtained from a Government flock in which it was fairly certain that salmonellosis had never existed. None of these samples exceeded a titre of 50 though most of them gave " O " titres at that level.

(3) *Prastio.*—Serum samples were obtained about two weeks following the outbreak from four animals which had survived clinical infection and 12 ewes which had not shown signs of the disease.

The " O " titres obtained were :—

Survivors : 1,250, 1,250, 1,250, 833.
Normal controls : 50, 50, 50, 50, 50, 50, 50, 50, 25, 25, 25, 25.

B. *Survey*

In February/March, 1956, a rough survey was carried out on local flocks principally in the central plains. Seventeen villages were covered including Tricomo and also the village into which most of Flock "A" had now been sold. In each village three flocks were selected and from each flock 10 faecal samples were obtained making a total of 510 samples for the whole survey. All 30 faecal samples from the same village were placed together in a bottle containing 250 ml. selenite broth and subcultured on to Desoxycholate Citrate Agar and Brilliant Green MacConkey bile salt agar after 24 hours and again after 48 hours, making four subcultures in all. No Salmonellae were isolated.

A second survey was made during the warmer weather of July to September, 1956, on similar lines. Eighteen villages were covered involving 540 individual samples. Once again no positive isolations were obtained.

C. *Transmission Tests*

(*a*) A two-year-old ewe was infected in the morning by dosing orally with about 200 ml. of a 24-hour broth

culture of *S. typhi-murium*. No clinical signs of illness were observed but its body temperature commenced to rise 33 hours after dosing. There followed a sharp transitory rise to 2·4° F. above its previous temperature with a return to normal by the evening of D + 3* day. The Salmonella were isolated regularly from the faeces for 14 days after dosing. The serum titre for "O" agglutination rose from 25 on D − 1 day to 250 on D + 7 day and remained at that level for at least one week.

(*b*) A second two-year-old ewe was similarly infected. Once again there were no clinical symptoms apart from a temperature rise commencing 24 hours after infection and reaching a peak of 5·2° F. above normal by the 33rd hour. Thereafter the temperature fell slowly to normal by the morning of D + 6 day. Positive faecal cultures were obtained regularly for 13 days after infection. Blood cultures taken at 48 and 96 hours after infection were negative.

(*c*) A six-month-old lamb whose serum "O" titre was 25 was selected after a negative faecal culture. Infection was carried out by the same method.

Temperature.—A rise commenced within nine hours and reached a peak of 5° F. above normal 24 hours after infection. Thereafter it remained high.

Clinical Condition.—Little was observed until the morning of D + 4 day when there was dullness, anorexia and blood-stained diarrhoea. On D + 5 day the condition was similar except that the diarrhoea appeared greenish and mucoid. The lamb died suddenly on the same day.

Faecal Cultures.—These were taken on D + 1, D + 2 and D + 4 days and were all positive for the Salmonella.

Blood Cultures.—These were obtained at the following intervals with the results shown :—

D day			
6 hours	negative	D + 2 day	48 hours positive
12 „	positive		54 „ negative
18 „	negative	D + 3 day	a.m. positive
D + 1 day			
24 „	negative		
30 „	positive	D + 4 day	a.m. positive
36 „	negative		p.m. „
42 „	„	D + 5 day	a.m. „

Post-mortem.—The principal features were acute broncho-pneumonia of the apical and cardiac lobes on both sides with congestion of the adjacent pleura. The pleural lymph glands were enlarged and haemorrhagic. The liver was a light bronze colour, and the gall bladder thickened. The abomasum appeared normal but the small intestine showed areas of diffuse and patchy inflammation throughout though the degree was less intense than in field cases seen. The mesenteric lymph glands were oedematous. Cultures were taken from the mesenteric lymph gland, ilio-caecal lymph gland, liver, bile, lung and mediastinal lymph node.

All were positive on direct culture.

Discussion

The general picture which has appeared so far is that non-specific ovine salmonellosis is probably a fairly common condition in the Middle East and appears to have a definite seasonal distribution favouring the early winter months.

All the outbreaks recorded were explosive in nature and lasted no longer than a fortnight. This in itself may explain why the disease has not previously been recognised here. The seasonal incidence coincides with the period when losses are expected from enterotoxaemia, parasitic gastro-enteritis, coccidioses, blue tongue, plant poisoning and piroplasmosis. Because of the short explosive nature of these outbreaks any line of treatment adopted would often appear successful by the time it could be applied, and errors in diagnosis would not become apparent.

The origin of these outbreaks is still not clear. From the spring/summer-time survey covering over 1,000 individual samples from 105 different flocks it would appear that ovine carriers are uncommon. This view is in support of Lovell (1932) who considered the carrier state to be improbable. Generally, the most likely origin is from human sources, though this has not yet been confirmed. In this part of the world sheep live in very close contact with the human population and under conditions of rural sanitation the number of potential vectors must include most of the village, without counting the ducks, dogs, domestic livestock and wild foxes. None of the shepherds concerned admitted to enteric trouble amongst their immediate families and it has not so far been possible to arrange for samples to be obtained from them.

No connection was traced between any of these outbreaks and none of the infected villages except Tricomo were included in the general survey.

So far no cases have been detected amongst goats, though in view of their more catholic tastes in food this might be expected, especially when grazing over municipal and village refuse heaps.

Summary

Five outbreaks of ovine salmonellosis are described involving 10 flocks. The causal organism in each case was *S. typhi-murium*.

The numbers in these flocks totalled 707, of which 68 animals became clinically affected and 46 died.

A survey of 1,050 animals in 105 flocks failed to reveal the presence of chronic carriers.

Three animals were infected experimentally, in one case with fatal results. A transient and intermittent bacteriaemia was observed in the early stages of infection.

The significance of this condition locally is discussed.

Acknowledgments.—It is a pleasure to acknowledge indebtedness to Captain J. Turk, R.A.M.C., for his interest and constant advice on this work, and to the Chief Veterinary Officer, Cyprus, for permission to publish this paper.

Acknowledgment is due also to the staff of the Command Medical Laboratory, Cyprus, and the field and laboratory staff of the Veterinary Service, Cyprus, for their assistance, and to the Salmonella Reference Laboratory, Colindale, for phage typing.

(*Concluded overleaf*)

* D = day of infection and the numbers refer to the days thereafter.

Current Literature

REPORT

Organisation of Control of Warble Fly Infestation in Cattle. (Published by the Organisation for European Economic Co-operation). May, 1957. Price 6s.

A thorough application of a derris wash to the backs of warbled cattle at intervals during the spring and early summer would eradicate the warble fly in one year. However, although derris has been a recognised treatment for warbles for over 30 years, the loss caused by warble flies in Europe alone, is estimated to exceed £30,000,000 per year. The failure to subdue warble fly is an indication of the lack of enthusiasm for warble fly control among farmers. The reason for this attitude is that the benefits which would follow the eradication of the warble fly are decidedly less obvious to the farmer than to the meat and leather trades. Nevertheless, it is the farmer who is expected to bear the expense and labour of the treatment without any financial reward for his industry. Moreover, the case for warble fly control is not helped by the fact that the derris wash destroys the parasite after it has damaged the host.

These factors are emphasised in this O.E.E.C. booklet which contains a summary of the Discussions of an International Meeting of the veterinary and agricultural representatives from 17 European countries held in Paris 1956. The conclusions reached by this meeting as a result of their deliberations are as follows.

(a) Derris (or cube) is still the most reliable insecticide for warble fly control.

(b) The farmer should be enforced legally to treat his cattle but, if possible, specially trained dressers should be appointed by the State.

(c) The control measures must be supervised by veterinary surgeons.

(d) The detrimental effects of warbles on meat and milk production should be widely publicised to convince the farmer that he would also gain from warble fly eradication.

(e) Attempts should be made to find a treatment which killed the warble before the host had been damaged.

The appendix to the booklet contains a report by Dr. Parish on the Isle of Wight warble fly eradication scheme and, by the same author, a good survey containing 29 references of current research work on warble fly control.

Salmonella Infection in Sheep in Cyprus.—*Concluded.*

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ABSTRACT

Warble Infestation as an Unsolved Economic Problem. PARRISH, W. E. (1956). *State Vet. J. Min. Agric. Lond.* **11.** 33, 1–7.

It is suggested that in a world where food shortages are common the real importance of this problem should not remain over-shadowed by the more immediate and spectacular economic losses due to infectious diseases, when in fact the warble fly may cause a greater loss in continental Europe than that due to foot-and-mouth disease. In Great Britain it is responsible for a loss of no less than £1,000,000 annually comprising in addition to loss of hides, spoilt meat, a fall in milk yield, and even unthriftiness—measured in one experiment to be of the order of 0·32 lb. per head per day. In America in 1954, warble fly was estimated to have caused more loss than all other *meta* and *protozoan* parasites together, amounting to 100,000,000 dollars annually or 2·8 per cent. of the total loss in cattle production.

In view of this and the fact that a satisfactory insecticide (derris) has been available since 1922 some concern is expressed at the slow rate of progress in satisfactory control or eradication of this parasite. Methods adopted in various countries are mentioned and attention drawn to the successful introduction in Cyprus in 1939 of specially trained teams of dressers under veterinary supervision. Until this time little success had followed any measures whether voluntary or compulsory. In less than 4 years following the introduction of these teams, Cyprus which had an initial incidence of 78·4 per cent of infected cattle, eradicated the fly. Such methods, modified to suit land-locked continental countries, have been applied in several European countries with conspicuous success. Thus the incidence to Holland fell from 25 to 3 per cent. in 4 years ; to 1 per cent. in parts of Sweden ; from 75 to 23 per cent. in France (using paradichlorobenzene in place of derris) and in Switzerland from 65·2 per cent. in 1946 to 1·85 per cent. and 4 warbles per beast in 1953. The most spectacular attack on the problem took place in Belgium where in 1955 the simultaneous double-dressing of all the cattle in the country was ordered.

In all these countries control is state-aided and supplies of parasiticides (mostly derris) are distributed free. In Great Britain warble fly infestation has been declared a scheduled disease, but infestation remains high. No practical scheme of eradication has yet been found to satisfy all the prevailing conditions. A trial scheme aimed at assessing some of the difficulties has been running on the Isle of Wight for the past 2 years and would appear to be proving successful as judged by the falling incidence from 16·0 per cent. with 10 to 20 larvae per beast in 1954 to 1·9 per cent. with less than 3 larvae per beast in 1956, although the final assessment, it is claimed, must wait for another 2 years.

Research on the problem aims at investigating 3 theoretical possibilities of breaking the life cycle of the fly ; (1) by preventing oviposition or penetration of

(*Concluded at foot of col.* 1, *page* 699)

The Victoria Veterinary Benevolent Fund

A General Meeting of the members of the Association was held at 10, Red Lion Square, on June 5th, 1957, at 10.15 a.m. There were present:—

Mr. H. W. Dawes, C.B.E. (President) in the chair, Major J. J. Dunlop, Mr. R. C. U. Fisher, Mrs. D. I. Glover, Messrs. G. N. Gould, E. F. Lewis, Professors J. McCunn and W. M. Mitchell, Mr. G. M. G. Oliver, Professor L. P. Pugh, Miss V. Tillemont-Thomason, and Miss Olga Uvarov.

The Secretary (Mr. C. W. Francis) read the notice convening the Meeting.

Minutes

On the motion of Mr. Gould, seconded by Professor L. P. Pugh, the Minutes, which had been published in THE VETERINARY RECORD, were signed as a correct record.

Election of President

On the motion of Professor L. P. Pugh, seconded by Professor J. McCunn, Mr. H. W. Dawes was unanimously elected President.

Election of four Vice-Presidents

Mr. Gould proposed the re-election of Captain J. M. Mitchell, Professor L. P. Pugh, and Professor G. H. Wooldridge as Vice-Presidents, together with Mr. Henry Sumner.

This was carried unanimously.

THE PRESIDENT: "May I refer to the loss of a very well known and esteemed vice-President whose death took place in November last. I refer, of course, to the late Mr. G. P. Male who was vice-President of this fund for many years, and who took an extraordinarily keen interest in its work. As members of the Council know, he also made a very handsome bequest of £1,000 in his will." Members stood in silence in memory of Mr. Male.

Election of Honorary Secretary

The President paid tribute to the work of the Honorary Secretary, Major Dunlop, and moved his re-election. The motion was carried unanimously.

Election of Honorary Treasurer

On the motion of Mr. Gould, the Honorary Treasurer was re-elected unanimously.

The Auditors, Messrs. Wilkinson, Chater & Co., were re-appointed.

Annual Report and Statement of Accounts

THE PRESIDENT: "It has been a very busy year. I think it is true to say that the calls on our work are as numerous as ever, and there is a continual need for support of our Fund. This has been referred to time and time again at meetings such as this, and it is as well that we remind the annual general meeting that the work of this Fund is as important as it was years ago.

"During the past few years we have been able to give considerable help to the children of beneficiaries from the educational point of view. It is most important work which I think will pay very handsome dividends.

"I feel I ought also to mention the splendid work of the Ladies' Guild. Their efforts on behalf of the Fund are absolutely amazing. You will see that, during the current year, the Fund has received from the efforts of those ladies no less than £1,570. I feel that this meeting should record in the minutes its appreciation of the work of the Ladies' Guild. I am sure, Mrs. Glover, you will realise that we think most highly of the ladies' work."

Mr. Gould said that a remarkably small amount of money was produced from collecting boxes in members' surgeries. It would seem that if they could get a couple of thousand members to take boxes which only produced 10s. each, it would bring in £1,000 instead of £34 0s. 1d. Every endeavour should be made to get boxes in, say, a thousand surgeries.

The President thought that a note in THE VETERINARY RECORD saying that any veterinary surgeon who desired to have a collecting box in his surgery could have one on application would be very helpful.

Mr. Gould suggested that the President should send out the boxes with a letter signed by himself asking for the support of selected veterinary surgeons scattered all over the country. If they waited until veterinary surgeons wrote in they would wait a long time.

After discussion the President said they might leave it to the Executive Committee to go carefully into the matter and to implement the wishes expressed as fully as possible. The annual report and statement of accounts were then adopted by the meeting.

Election of 10 Members of the Association

Professor Pugh moved the re-election of those members whose names appeared on page 3 of the report.

The motion was carried.

Abstract.—*Concluded.*

larvae using the latest insecticides. None appear to be successful to date but hope is held out for them in the form of a lacquer preparation; (2) by destruction of migrating larvae (which has included unsuccessful vaccination) and (3) by treatment of the larvae on the back as at present—the only effective insecticide to date being derris scrubbed into the skin. Investigation of the reported value of phenothiazine treatment in the control of warble fly does not substantiate the claim. It would appear, however, that a promising drug is being investigated in Germany.

The author points out that owing to the inability to breed *Hypoderma* species in the laboratory, carefully controlled experiments have hitherto been difficult if not impossible, but that this failure is now being overcome and should hasten research work on this important problem.

In Parliament

Transit of Animals

MR. A. HENDERSON asked the Minister of Agriculture, Fisheries and Food what steps he proposes to take to control the traffic in unweaned calves and the conditions under which such calves are transported in the United Kingdom.

MR. AMORY: There are no regulations governing the sale of unweaned calves. The Transit of Animals Orders, made under the Diseases of Animals Act, contain very detailed regulations governing the conditions to be observed when livestock, including calves, are transported in this country. These are enforced by local authorities and the police. As at present advised, I am doubtful whether there is any need for further regulations, but if hon. Members have any particular points in mind and will let me know, I will gladly consider them.

MR. HENDERSON: Has the attention of the Minister been drawn to a recent report in the national Press stating that in one instance 98 young calves were transported nearly 300 miles in one cattle truck in indescribable conditions? Does he not consider some action ought to be taken to prevent cruelty of this kind?

MR. AMORY: I agree that every possible action should be taken to prevent cruelty. That incident, I believe, was not a recent one but occurred last year.

MR. HENDERSON: Last month.

MR. AMORY: No. I think that that incident to which the right hon. and learned Gentleman referred —certainly if it is the one I am thinking of—occurred last year. Enforcement action is a matter for the local authorities.

SIR A. GOMME-DUNCAN: Does my right hon. Friend not agree that one of the features which is most unsatisfactory is the manner of the provision of milk for the calves to drink *en route*? It seems that calves are expected to drink as adults drink instead of being helped with sucking instruments, which are on the market, and the use of which would improve matters enormously.

MR. PAGET: Is the right hon. Gentleman aware that the movement of these very young calves to market always involves a great deal of cruelty? Why should they not be slaughtered on the farms and moved as carcases?

MR. AMORY: The difficulty in general, as I think the hon. and learned Gentleman will agree, is with the slaughtering facilities. We want to ensure that they really are humane, and they can be better controlled at the slaughterhouses.

MR. MOYLE: In considering the transport of unweaned calves, would the Minister be good enough to ask his inspectors to have a look at the West Country and West Wales, where, I am advised, there are certain collective hideouts where people trafficking in unweaned calves collect the calves and then transport them to London in conditions which, to say the least, are deplorable? I do ask the Minister to direct his attention and that of his officials to that matter.

MR. AMORY: I must apologise to the hon. Member for Oldbury and Halesowen (Mr. Moyle) for omitting to ask permission to answer his Question at the same time as I answered the Question of the right hon. and learned Gentleman the Member for Rowley Regis and Tipton (Mr. A. Henderson). I will certainly look into the matter which the hon. Gentleman the Member for Oldbury and Halesowen has raised. I attach very great weight to his opinions in these matters.

Rabbits

MR. VANE asked the Minister of Agriculture, Fisheries and Food whether he is aware of the failure of his campaign to prevent the increase of rabbits in agricultural areas through the carelessness of a few people who have neglected to destroy the few rabbits on their land; and what action he proposes to take in the limited time still available to him before the rabbit again becomes an expensive and wasteful pest.

MR. AMORY: I agree that there is scope for much more vigorous action against rabbits by many occupiers. Where, after due warning, occupiers fail to carry out their responsibility to deal with rabbits on their land, my officers are instructed to enter and take action under my statutory powers. I shall not hesitate to take vigorous default action as required.

MR. VANE: Is my right hon. Friend aware that such action is not likely to prove effective, that the rabbit is all but out of control again, and that unless after this harvest he manages somehow or another, with or without the aid of the police, to have the rabbits put down, we shall once again find the country having to import millions of pounds worth of food every year to make up for what the rabbits have eaten?

MR. AMORY: I think that rabbit control can best be done by voluntary co-operation, as far as that is possible. Where that fails, then, as I say, I shall not hesitate to take default action, which, I believe, is the most effective action which so far we have been able to devise.

THE SOUTH-EAST MIDLANDS DIVISION

A number of the members' ladies of this Division have formed a branch of the Ladies' Guild of the Victoria Veterinary Benevolent Fund. At a recent meeting the following officers were appointed:—

Chairman, Mrs. A. A. Lamont,, Hon. Secretary, Mrs. E. G. Sutton, and Hon. Treasurer, Mrs. G. Taylor. The committee will comprise these ladies together with Mesdames F. A. Gordon, E. A. Tutton, and J. B. Baxter. The new branch's first social function will be a cocktail party, to be followed later in the year by a dance. It is earnestly hoped that additional members will be forthcoming to support the very valuable work of the Ladies' Guild.

News and Comment

THE ROYAL SHOW

This year's Royal Show, the 4th to be held at Norwich, was honoured by the close interest of the Duke of Edinburgh who, as President of the Royal Agricultural Society of England paid 4 separate visits. On the Wednesday he accompanied the Queen on a 3-hour tour of the exhibits.

The principal veterinary officer was Mr. H. Dawes, C.B.E., of West Bromwich, assisted by Mr. F. Jagger of Shrewsbury and Mr. D. F. Oliver, honorary secretary of the B.V.A. Also assisting were two eminent local practitioners, Mr. J. McClintock of Norwich and Mr. W. F. Loveless of Diss.

The Chief Veterinary Officer of the Ministry, Mr. J. M. Ritchie, was in attendance for part of the time at the Ministry's stand.

The animals stood up to the trying travelling conditions exceedingly well. All the ailments, though numerous, were of a general nature such as would be encountered in everyday practice. One sow died of heat-stroke immediately on arrival and one sheep died of enterotoxaemia.

An innovation, suggested by the Duke of Edinburgh, was the President's Trophy, a competition which comprised the assessment of fodder, and the judging of stock. There were more than 80 entries. This contest was but one practical illustration of the Duke's keen interest in, and knowledge of, agriculture, which drew appreciative comment wherever he went.

THE ROYAL SOCIETY OF HEALTH

The Royal Society of Health held its Annual Council Luncheon at the Grosvenor Hotel, Victoria, on July 9th, when the President, Lord Percy of Newcastle, with Professor Harold Burrow, Chairman of the Council, received the distinguished guests who represented practically every aspect of public health activity.

Professor Burrow who, as readers will recall, is the first veterinary surgeon ever to be made Chairman of the Council of the Society, proposed the toast to "The Guests," who included Mr. E. R. Callender, President of the B.V.A., Mr. G. N. Gould, President, Royal College of Veterinary Surgeons, and Mr. W. G. R. Oates the Registrar. Professor Burrow referred to the great growth of the Society during the past few years. It was now, he said, the largest health society of its kind in the world, and its membership was increasing daily.

Mr. R. McKinnon Wood, Chairman of the London County Council, who replied, paid tribute to the work of the Society.

The toast of "The Royal Society of Health" was proposed by Sir Harry Platt, President of the Royal College of Surgeons, and replied to by Sir Arthur Massey, a Vice-President of the Society. Over 130 guests were present.

UNIVERSITY NEWS

Bristol

The following candidates were successful in the recent final examination for the degree of Bachelor of Veterinary Science and were admitted to the degree at a Congregation held on Wednesday, July 10th. This year the ceremony was held in the Colston Hall where graduates from all Faculties were admitted at one time by the Vice-Chancellor, Sir Phillip Morris.

At a more intimate ceremony in the afternoon the new graduates were admitted to membership of the Royal College of Veterinary Surgeons. For this ceremony the President, Mr. G. N. Gould, was in attendance and was introduced by Professor Ottaway. Following the admission of the graduates the President congratulated them and made a short speech in his characteristically genial way. In this Mr. Gould reminded those who had so recently been students of all the advantages which had been theirs and urged them to be mindful of their duties and jealous of their privileges in the future.

The new members of the Royal College are:—

Barden, P. J.; Batten, A. T. H.; Chinn, W. T.; Ellis, G. H. C.; Fardell, Molly; Gale, J. B.; Green, B. J.; Green, J. M.; Hearne, R. B.; Horlock, J.; Jones, N. A.; Kelly, D. F.; Lewis, L. M.; Littleton, C. E. J.; Macpherson, I.; Martin, N. N.; Peacock, M. R.; Phillips, D. H.; Pugh, D. M.

R.C.V.S. EXAMINATIONS

EDINBURGH

Fourth Examination

Dodson, G. R. and Rodger, J. L.

Final Examination

Gee, B. D.; Gray, Brian; Humphrreys, Medwyn; Johnson, D. E.; Nyun, M.; Stretch, I. L. and Walker, W. D.

BRISTOL

Final Examination

Choy, T. L. and Datt, S. C. (credit in Surgery).

DUBLIN

Second Examination. Physiology only:—

Hand, P. J. and O'Driscoll, T. L.

Third Examination. Hygiene only:

Boothman, J. H.; Boyce, W. T. M.; Collins, T. D.; Crawford, H. M.; Demery, Y. W.; Feeney, J. K.; Flannery, Donald; McAuliffe, M. J.; McIver, S. H.; McParland, P. J. (credit); and Wilkie, S. D.

Pathology only:

Atock, M. A.; Cousins, F. G. O.; Cox, Edward; Dolan, T. C.; Doyle, I. M.; Duffy, E. F.; Gaffney, W. M. N. (credit); Gormley, B. A. (credit); Harrington, D. P.; Kenny, M. P. (credit); Leslie, N. W.; Lyons, Valentine; McKinley, P. J.; Murray-Hayden, P. J.; O'Brien, Patrick; O'Connell, John; O'Neill, Alexander; O'Neill, Conal; O'Donnell, L. I.; Prendergast, M. J. G.; Quill, T. S.; Schlesinger, Percy; Smith, F. M., and Smyth, J. J.

Final Examination

Byrne, C. J.; Clarke, J. P.; Cooney, J. F.; Crowe, J. F.; Daly, Edward; Doherty, P. L.; Gibney, E. E.; Jones, R. F. C.; Keane, M. J.; Kilroy, C. S. M.; McCarthy, William; McGilligan, C. A.; McLaughlin, David; Maloney, Patrick; Mansfield, M. P.; Martin, W. H.; Mulvey, W. J. O'Connor, S. P.; Rispin, Kevin; Smyth, D. J.; Smyth, L. J. F.; Watkins, James and York, A. J.

LONDON

Third Examination. Pathology only:

Ali, M. J.; Angelo, S. J.; Bhatia, T. R. S. and Shah, S. I. H.

Final Examination

Baker, K. P.; Byrne, G. A.; Chaudhari, A. Q.; Davison, R. S.; Hughes, J. R.; Hussain, Shabbir; Jones, W. A.; Oakley, G. A.; Savvides, J. S.; Stocks, B. M. and Wilkinson, John.

MR. MATTHEW DUGDILL

Mr. Matthew Dugdill, whose death occurred on June 28th, was one of the oldest active members of the profession. In his 85th year he was attending cases up to 9 weeks before he died. He qualified at the Royal (Dick) School of Veterinary Studies in 1894, and had been in practice at Patrington for 57 years. Before setting up his own plate he had been an assistant at Worksop, Croydon, and Reading.

The funeral service was held at St. Patrick's Church, Patrington, on July 3rd and interment took place in the family grave at Rylstone. Mr. Dugdill, a widower, is survived by three daughters to whom deep sympathy is extended.

PERSONAL

Birth

WILLIAMSON.—On July 1st, 1957, to Josephine Anne, wife of Philip Taylor Williamson, B.SC., M.R.C.V.S., at "Greengates", Shinfield Green, Reading, Berks, a daughter, Fiona Jane.

Mr. T. A. McDowell, M.B.E., has been appointed Press Officer of the Ministry of Agriculture, Fisheries and Food in succession to Mr. A. D. Bird, who recently resigned from the Department.

COMING EVENTS

July

24th (Wed.). Summer Meeting of the South East Midlands Veterinary Association, at May & Baker Ltd., Dagenham. (Coach departs Cardington Street, Euston Station, 11 a.m.)

25th (Thurs.). Ordinary General Meeting of the Royal Counties Veterinary Association at the Royal Veterinary College, Streatley, 2.30 p.m.

26th (Fri.). General Meeting of the Yorkshire Veterinary Society in the Government Buildings, Crosby Road, Northallerton, 2.30 p.m.

30th (Tues.). British Small Animals Veterinary Association, Metropolitan Area, at Crown Tavern, Brewer Street, W.1, at 8.15 p.m.

August

25th-31st. 75th Annual General Meeting and Congress of the B.V.A. at Cambridge.

ADDRESSES OF DISEASE INFECTED PREMISES

The list given below indicates, first the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

Anthrax

Essex. Lodge Farm Thaxted, Dunmow (July 9).

Lancs. Windy Harbour Farm, Harbour Lane, Warton, Preston (July 10).

Renfrewshire. Railway Fields, North of Barcaple House, Newton Mearns, Glasgow (July 7).

Salop. Heath House Farm, Romsley, Bridgnorth, (July 15).

Yorks. Sunhill Farm, Constable Burton, Leyburn (July 13).

Foot-and-Mouth Disease

Devon. West Leigh, Diptford, East Brent (July 8); Higher Eston Farm, Berry Pomeroy, Totnes (July 14).

Fowl Pest

Aberdeen. Murriat, Insch (July 10); Woodhill, Old Meldrum (July 12).

Lancs. Banks Farm, Station Road, Little Hoole, Preston (July 8); Bernard Dene, Hall Lane, Longton, Preston; Peel View, Drunacre Lane, Longton, Preston; The Poplars, Holmeswoode, Ormskirk (July 9); Mill Hey Farm, Pack Lane, Longon, Preston (July 10); Longton Heys Field, Longton, Preston; Avondale, Station Road, Little Hoole, Preston (July 12), Whitehouse Farm, Moss House Lane, Much Hoole, Preston; Hungerhill Farm, Moss Lane, Much Hoole, Preston; Moonhay Farm, Moss House Lane, Much Hoole, Preston (July 13).

Norfolk. Old Rectory, Billingford, East Dereham; 16, Hall Lane, Billingford, East Dereham; Beech House, Gooderstone, King's Lynn; White House Farm, North Tuddenham, Dereham (July 10).

Surrey. 10, Smallholding, Woodmansterne Road, Wallington (July 8).

Sussex. Little Funnells Farm, Maynards Green, Horam (July 8); Beechhurst, Horam (July 9).

Yorks. Higher Grange Farm, Sowerby-under-Cotcliffe (July 8); Far Farm, Ryther (July 8); Greenacres, Sessay, Thirsk (July 9); Calverley Clough Farm, New Lane, Tong, Bradford; Beacon Hill, Kirby Sigston, Northallerton (July 15).

Swine Fever

Berks. Tuckers Hill Farm, Ashford Hill, Newbury (July 9); Evendons Lodge, Evendons Lane, Wokingham; Evendons Farm, Evendons Lane, Wokingham (July 11).

Ches. Yew Tree Farm, Fallibroome, Prestbury, Macclesfield (July 9).

Devon. Higher Larcombe Farm, Diptford, South Brent (July 15).

Glamorgan. The Old Glynogwr Colliery, Gilfach Goch, Bridgend (July 9).

Hants. Home Farm, Duckmead Lane, Liss; Wedmans Farm, Rotherwick, Basingstoke (July 9); Newmer Farm, Wield, Old Alresford (July 10); Newlyns Farm, Upham, Southampton; Upham House, The New Piggeries, Fir Tree Farm, Upham, Southampton; Pritchards Nursery, Stanpit, Christchurch (July 12); New Farm, Winchester Road, Upham, Southampton (July 15).

Herts. Bulstrode Farm, Bulstrode Lane, Chipperfield, King's Langley (July 9).

Kent. Wrotham Hill Farm, Wrotham, Sevenoaks (July 9).

Lancs. Lower Kilshaw, Carleton, Blackpool (July 8); Bottomfield, Woodhouses, Ashton-under-Lyne (July 9); Harridge Farm, Dimple, Egerton, Bolton (July 12).

Leics. New House Grange, Sheepy, Atherstone, Warwicks (July 15).

Lincs. Welland House, Surfleet Marsh, Spalding; 214, Second Lane Allotment, Skewbridge Gardens, Boultham (July 8); Forty Foot Farm, Pointon Fen, Sleaford; Pointon, Sleaford (July 10); The Cottage, Green Lane, Eagle Moor, Eagle (July 15).

Middx. 1, Woodbine Cottage, Cambridge Road, Ashford Common (July 12); 47, Poplar Road, Ashford (July 15).

Oxon. The Croft, Hook Norton, Banbury (July 8).

Somerset. Home Farm, Backwell, Bristol, Three Oaks Farm, Chedzoy, Bridgwater; Winroth, Backwell Hill, Backwell, Bristol; Hulkshay Farm, North Petherton, Bridgwater (July 8); Swann Row, Ladymoor, Coseley, Bilston (July 12); Pitt Farm, West Buckland, Taunton (July 15).

Surrey. Bristow Farm, James Road, Camberley; Conford, Parkhurst Road, Horley (July 10); Glory Farm, St. Pauls Road, Dorking (July 12).

Sussex. Rushy Hill Farm, Outlook Avenue, Peacehaven, Newhaven; Garstons Farm, Twineham Lane, Bolney, Haywards Heath (July 15).

Warwicks. Bury Mound Farm, Peterbrook Road, Shirley (July 12); Ivydene, Five Ways, Hatton (July 15).

Worcs. The Poplars, Brierley Hill Road, Wordsley, Stourbridge (July 9); Ofmondene, Stourbridge Road, Fairfield, Bromsgrove (July 11); Chapel Farm, Heightington, Bewdley; Lodge Farm, Chaddesley Corbett, Kidderminster (July 15).

Yorks. Barrowby Hall Farm, Garforth, Leeds (July 15).

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal opinions of the writer only and their publication does not imply endorsement by the B.V.A.

The Technical Development Committee

Sir,—The Technical Development Committee of the B.V.A. are continuing their series of handbooks with one on unusual domestic pets and circus animals.

It would be very helpful to the Committee if, in planning this handbook, they could have the co-operation of practising veterinary surgeons. Information is invited on such matters as: what are the unusual pets met with in practice? What basic information would be of value to veterinary surgeons called upon to treat these animals? What information would be of value when advising clients on the care and maintenance of unusual domestic pets?

It is intended to present the information in this booklet in a highly condensed form. The Committee are anxious, therefore, to gather information from as wide a field as possible. Personal experiences of dealing with mammals, birds, reptiles and fish would be most useful and need only be sent as rough notes.

All information, no matter how apparently simple, will be gratefully acknowledged, and should be sent to me as Chairman of the Sub-Committee who are preparing the draft handbook.

Yours faithfully,

J. A. DALL.

British Veterinary Association,
7, Mansfield Street,
London, W.1.
July 15th, 1957.

Eczema in Neutered Cats

Sir,—I was interested to read Mr. J. Marshall's letter in the issue of THE RECORD dated July 6th in which he discusses the treatment of some hormone deficiency diseases in neutered male and female cats.

My experiences with testosterone implants are that they have been beneficial in the treatment of alopecia and poor hair growth, but as I have very seldom used them in cases of eczema in cats I do not feel able to express a definite opinion. I can only say that in the few cases where I have used them for the treatment of eczema they seemed to be of no use. It is curious that in the treatment of alopecia I have found the testosterone implants far more effective in the neutered female cat than the neutered male where there was only a partial regrowth of the coat. However, I think it is impossible to generalise from this as it is clearly a very complex subject. I, too, feel that reports of more cases from other veterinarians would help to clarify the position.

I must confess that I have not yet considered it necessary to treat the dry type of miliary eczema or the diffuse moist type with testosterone implants, having for the most part had reasonably reliable, but not extremely rapid, results from the oral administration of vitamin tablets containing the B group plus B_{12} and others.* I have also found recurrences of the trouble sometimes occur in subsequent years and sometimes earlier. For external application I usually employ 1 per cent. silver dinaphthyl methane disulphonate†, or calamine lotion.

I think that if a fish diet is not the complete cause of these types of eczema in neutered cats, it may well have something to do with the condition, and I usually advise those owners who have been feeding it to affected cats to stop doing so or at least reduce the amount of fish in the diet as much as possible for a period. I feel that the neutering of cats may render them more susceptible to eczema when certain factors are not present in the diet, whereas entire cats on a similar diet would be unaffected. If these food factors are provided recovery will follow, but, of course, a recurrence would be liable to occur whenever the diet became inadequate in this respect.

I wonder whether removal of the gonads would throw an extra strain upon the adrenal cortex with which there is an endocrine inter-relationship? In some animals the extra strain thrown upon the adrenals might be too great and a metabolic disturbance leading to eczema result, unless they could be judiciously stimulated with ACTH, or possibly cortisone be administered. It is interesting in this connexion that Marshall's case of eczema in a neutered female cat did respond to ACTH once.

I wonder if there has been any major dietary change in the feeding of cats which could account for the increase in the number of cases of eczema Marshall speaks of, and whether the use of tinned foods nowadays has any connexion with the matter? Further, is it possible to delay the neutering of some male kittens so that those which later in life become a social nuisance can be neutered then, and those which do not, need never be neutered at all? All these cats would be better developed physically than those neutered as kittens, and, of course, there would be fewer susceptible to hormone deficiency diseases. In the case of females, however, there seems to be no alternative to spaying unless one wishes to deal with successive litters of kittens.

Yours faithfully,

W. E. M. PHILLIPS.

4, Lake Road,
Fairhaven,
Lytham St. Annes.

July 11th, 1957.

* Biotin, Murnil Bayer Products; or injections of veterinary Cytamen, Glaxo Laboratories.

† Viacutan lotion, Ward, Blenkinsop & Co. Ltd.

Erratum: Herd Infertility—Herbage Manganese Levels

Sir,—Owing to an error in calculation, the manganese levels in herbage given in my article on herd infertility in THE VETERINARY RECORD of February 16th, 1957, were lower than was actually the case. On page 127, in the section on Manganese Deficiency, the following figures should replace those as they occur successively in the text in terms of p.p.m. Mn—32.0, 194.6, 32.0, 49.1, 82.7, 49.1, and on page 129, 83 p.p.m. should replace the figure of 28 p.p.m. as the critical level of manganese in terms of repro-

ductive efficiency, indicated from the field cases reported.

In the following summer of 1956 mineral analyses of 21 herbage samples were carried out from a further 18 farms with a history of herd infertility persisting over 2 years or more, during the summer grazing period, as well as through the winter. The levels of calcium, phosphorus, potassium, copper, manganese and iodine were determined. Sixteen of the farms showed levels of Mn on a dry matter basis ranging from 24 to 86 p.p.m. with a mean level of 56 p.p.m. The 2 other farms showed levels of 107 and 320 p.p.m. On 3 control farms with histories of good herd fertility during the summer grazing period, levels of 32, 105 and 143 p.p.m. Mn were obtained. The first figure quoted tends to contradict previous assumptions of critical levels, but the herd concerned was one in which rearing methods aimed at the maximum development of ruminal digestion compared with any other herd known by the author. The other mineral levels obtained from samples on the 3 farms were: CaO—0.70, 0.84 and 0.81 per cent.; P_2O_5—0.96, 0.83 and 0.90 per cent; K_2O—3.40, 2.40 and 3.44 per cent.; Cu—9.1, 8.2 and 8.7 p.p.m.; I—0.25, 0.35 and 0.29 p.p.m. respectively, all based on dry matter content. The levels of these minerals in the samples from the 18 infertile farms were: CaO—0.56 to 1.96 per cent. (mean 1:02 per cent.); P_2O_5—0.54 to 1.20 per cent. (mean 0.84 per cent.); K_2O—1.80 to 4.60 per cent. (mean 3.24 per cent.); Cu—5.2 to 13.0 p.p.m. (mean 8.6 p.p.m.); I—0.01 to 0.49 p.p.m. (mean 0.28 p.p.m.). On only 5 of the 18 low fertility farms were low copper levels found ranging from 5.2 to 7.0 p.p.m. Cu, 4 of these also showing low Mn levels. Two low Mn farms also showed the lowest I levels of 0.01 and 0.06 p.p.m. In the herd reported as showing an improvement in fertility without treatment, the Cu and Mn levels in the same field sampled in successive years were found to have risen from 5.5 to 8.7 p.p.m. Cu and 83 to 105 p.p.m. Mn respectively.

On one farm 2 fields were available for comparison. One, a mixture of ryegrass, cocksfoot and clover on which the cows showed an obvious dislike of its herbage and also ate the bark off trees, gave a level of 76 p.p.m. Mn, compared with that of 287 p.p.m. Mn for the other field producing higher milk yields and good herbage palatability with a mixture of ryegrass and cocksfoot only. This field showed only a 3.5 per cent. rise in crude protein levels in the herbage over the other field, there being no similar differences in the mineral levels of P, Ca, K, and Cu.

These above findings are not intended to be conclusive, but they do indicate the need for further investigation into the critical levels of herbage Mn for normal reproduction in the dairy cow, under intensive grassland management.

Yours faithfully,

I. B. MUNRO.

Cattle Breeding Centre,
Shinfield,
Reading,
Berks.

July 2nd, 1957.

Two-way Radio Telephones

Sir,—In his latest communication to you Mr. Straiton very modestly states that he "really worked hard" during the year that he motored 96,000 miles. I am sure that we, within the profession, now appreciate his worth. I am, however, a little hazy as to how one tots up such a mileage. At an average speed of 32.5 m.p.h. one would cover the 260-odd miles in some 8 hours. Presumably, during such a daily tour, one would be bound to make 30 visits, and in giving a reasonable service one would no doubt spend some 15 minutes with each client Thus would be spent 15½ hours of Mr. Straiton's day to which we should add a further 1½ hours for natural processes such as eating, washing and shaving.

I am sure, Sir, that many of your readers would be most interested to learn how many of the remaining 7 hours of Mr. Straiton's day would be spent in playing dominoes.

Yours faithfully,

P. R. GREENOUGH.

Avalon House,
Castle Cary,
Somerset.

July 14th, 1957.

Sir,—The most fascinating things in THE RECORD these days are Mr. Straiton's figures, especially those in his latest announcement that his yearly mileage once exceeded 96,000.

My arithmetic makes that over 260 miles a day. Allowing for work slackening a little on Sundays it means he was often driving over 300 miles in daily visits. If we assume an over-all average speed of 30 m.p.h. (which is fair for country visits) it gives him 10 hours a day in driving alone.

I hate to stir up an old controversy but it would be interesting to learn if this was in the days before he held such enlightened views on obstetrics. In the old days, he has informed us (*Vet. Rec.* **69.** 395) he many times spent 6 to 10 hours on embryotomy cases while later he widely practised caesarean section.

Mr. Straiton's practice is clearly an extensive one. I understood the effective radius of the mobile radio telephone was little over 15 miles. There is, no doubt, a good case to be made out for the use of these instruments, just as there is for the avoidance of undue hurry in obstetrics. But it is a pity that Mr. Straiton spoils things, to my way of thinking, with exaggerations.

Yours faithfully,

P. J. DINGLE.

East Rudham,
King's Lynn,
Norfolk.

July 13th, 1957.

Sir,—Some of the statements recently made in your correspondence columns have been, to say the least of it, startling. The figures given by Mr. E. C. Straiton in respect of car mileages cannot, I feel, be allowed to pass without comment. When stating that

his personal yearly mileage once reached just over 96,000 Mr. Straiton assures us that he really worked hard that year. He certainly did work hard as a chauffeur but what of his work as a veterinary surgeon? Let us assume that his average speed was something about 30 m.p.h. and that he took no holidays or even a day off during the year. We find, by not too arduous calculation, that he is driving his car for a little more than 9 hours per day. Thus if he left his surgery at 9 a.m. and drove continually with no rest or food he would be back at 6 p.m., having done nothing except drive the car. When an allowance is made for reasonable leisure, holidays and the inevitable book-keeping the implications become staggering. What happened when 250 animals were to be tuberculin tested or 70 or 80 to be de-horned? I can only assume that either such time-consuming activities were left to a colleague or that Mr. Straiton drove all day and worked all night.

To a country practitioner who clocks up a regular 22 to 25,000 miles per annum these figures require a great deal of clarification.

Yours faithfully,
H. LAMBERT SMITH.

Manor House,
Rowde,
Devizes.

July 13th, 1957.

Sir,—As one who occasionally finds time to indulge in the piscatorial art I always listen to tall stories with that degree of sympathy and tolerance associated with this simple pleasure, and it is fascinating to speculate on the claims which we may now hear on the annual mileage covered by practitioners: 96,000 in a year is pretty good. This is approximately 265 miles a day, shall we say, 9 hours driving at 30 miles per hour, quite apart from any professional work.

One really must congratulate Mr. Straiton upon his endurance.

Yours faithfully,
L. GUY ANDERSON.

49, Cambridge Street,
Aylesbury,
Bucks.

July 13th, 1957.

Sir,—I have been interested in the correspondence regarding this apparatus as I worked at one time in a practice which used it.

The acquisition of an aerial of the R/T type on top of one's car attracts attention in a district where such a thing has not been seen previously—"the vet. with the telephone in his car" and so on. There is also the type of client who is enraptured with the possibilities of being able to contact his veterinary surgeon quickly by this "go-ahead, up-to-date mechanism," indeed, it does give some satisfaction to be able to turn in at the gate of a farm as the farmer puts down his telephone.

I am moved, however, to write and point out some of the disadvantages of "car-radio." I know little of the economics of the system, though I do appreciate that it can save car-miles and unfortunate doubling-back on one's journeys. There are parts of the country where hills are a considerable disadvantage, in that the home base may or not be able to hear the car transmission. This is especially difficult when leaves are thick upon the trees. Where I worked, fairly good reception in winter was poor to hopeless in summer. This can be very exasperating when one knows that the nearest point of good reception is several miles away, perhaps in the direction that one has just left. I should point out that the home base set is usually stronger than those in the cars, and can be heard at greater distances, and thus the disadvantages which Mr. Wilkinson mentions; that one cannot hear the set at a distance, and anyway the car battery runs down if the set is left on. The system can also be open to considerable abuse by clients who *expect* you to be on the doorstep because you have R/T installations.

Finally, machines are not infallible, and these go wrong. Then one has to revert to the old method of leaving a list of one's visits, and getting the staff to telephone round. This may last for several days if servicing depots are not handy. Additionally, one's car may be laid up, and the spare one may not be wired for R/T.

Perhaps this letter will be of help to those considering the system. It can be exhausting and exasperating if one is conscientious in a busy practice.

Yours faithfully,
R. B. STEVENSON.

Amery Farm,
Alton,
Hants.

July 10th, 1957.

Sir,—Mr. E. C. Straiton states that one year he really worked hard and covered over 96,000 miles. I hope his days were long enough to allow him to do a little veterinary work in between driving. At a conservative estimate, he would be driving solid for 10 hours a day. Unless he is living in a sparsely populated area, where farms are miles apart, one presumes that he is calling on a considerable number of clients during that mileage, and my recollection of farm practice is that you are not on and off the farm in 5 minutes.

Perhaps that 96,000 miles includes a prolonged touring holiday?

Yours faithfully,
C. STEELE.

65, Seaview Road,
Wallasey,
Cheshire.

July 13th, 1957.

Sir,—

Ninety-six thousand miles a year
Is stretching things a bit, I fear.
Twelve hours a day, seven days a week,
Come, Mr. Straiton, when do you sleep?

Yours faithfully,
ROBERT B. HOOPER.

Colyton House,
Clatterford Road,
Carisbrooke, I.W.

July 14th, 1957.

Sir,—I have read with amazement a statement in this week's RECORD by Mr. Straiton of Stafford, that in one year he personally completed 96,000 miles by car during his duties as a veterinary surgeon. This is indeed a staggering feat. I wonder if the writer realises what he has accomplished? It means he travelled approximately 265 miles per day every day for a year. I presume he had some busier days than others and that at times he was down to a paltry 200 miles or less which means that on some days he was travelling anything up to 350 miles a day. No doubt he stopped occasionally from his wild rush through the Staffordshire countryside for a bite or a sup or even a short nap or possibly to fix up a friendly game of dominoes: he once informed us he spent the best part of a night in this uplifting manner with a client. For the life of me I cannot see what useful purpose was served. If I had felt as confident as Mr. Straiton that the cow would not calve before morning, I think I would have returned home and got some much needed rest, but then, of course, I do not play dominoes.

If Mr. Straiton stopped occasionally, as I presume he must have done if he has to earn sufficient to pay for the petrol and wear and tear, he cannot have been travelling at an average speed of more than 15 to 20 m.p.h. which means that he must have been at the wheel for 15 to 16 hours daily for 365 days. I notice he states he worked very hard that year. I consider that an understatement. Keeping a car in almost perpetual motion for 15 or 16 hours daily for a whole year is a colossal task, and would leave very little time for anything else.

Yes, Sir, it was a wonderful feat of endurance and leaves lesser mortals like yours truly to sit and ponder upon our weaknesses.

Yours faithfully,
R. E. S. TUCKEY.

St. Mary's House,
Whitchurch,
Shropshire.

July 13th, 1957.

Our correspondents do not give Mr. Straiton credit for being much of a driver. The fortunate possessor of a 100-mile-an-hour motor car should surely average better than 30 m.p.h.?—Editor.

Further Light on Clinical Problems

Sir,—I have been prompted to write this letter after reading the symposium on clinical problems in everyday practice.

In this practice I have found that no problem exists when docking puppies. I carry out the operation when the puppies are 5 days old using an articulated dental prosthesis which can be readily cleaned and sterilised using a proprietary compound*.

The following treatment of idiopathic alopecia may be of interest: it is, at least, hallowed by time!

"Take ointment of poplar-buds and virgin-honey, an equal quantity of each; mix them well together, and rub with this twice every day the places that are bare; continue this for 15 or 20 days, in which time the hair will grow again, as thick and smooth as if it had never fallen off."

This preparation is also said to be useful for making hair grow, after a dog has been treated for mange, in the following way—the recipe comes from the same source:—

"Take large millet and sweet turnip roots, which boil in cow's urine till it is like a broth, and with it rub your dog."

Yours faithfully,
H. E. CARTER.

121, Broadfield,
Harlow, Essex.

July 14th, 1957.

Reference

ANON. (1785). "The Sportsman's Dictionary." pp. 375 and 455.

* Steradent.

Short Docking of Dogs

Sir,—This article, which appeared in THE VETERINARY RECORD of July 6th, has been reproduced in *Our Dogs*, June 12th, 1957, without my permission or that of the Editor. My permission would not have been given for several reasons, but mainly because the article was intended solely for an audience of veterinary surgeons (Central Veterinary Society, March 7th), and its slight criticism of my profession, while it might be humorous in an exclusive gathering, is deplorable when it appears in the lay press. For this, I wish to apologise.

Yours faithfully,
ROSEMARY WELCH.

23, Pheasants Way,
Rickmansworth,
Hertfordshire.

July 15th, 1957.

ERRATUM

We regret an error in the quotation made last week from the Presidential address delivered to the Central Veterinary Society by Mr. C. E. Woodrow. The sentence "better conditions which . . . will *not* be offered," should have read, will *now* be offered. The error occurred in the shorthand writer's notes of the meeting as submitted for publication.